S W P A
MALARIA ?

VOL. 1 NO. 4 HQ, MALARIA CONTROL, APO 503 ✓ 5 March 1944

During the month of December and early January the 6th Malaria Survey and 12th Malaria Control were involved in an extensive scrub typhus problem at Goodenough Island. They might well be called a typhus survey and control organization. They arrived at the following conclusions:

1. Survey of Terrain. Before plans to combat Scrub Typhus can be made, a preliminary survey is imperative. The survey must be done on foot in the Area suspected.
   a. All flood streams, dry creek beds and general slope and drainage must be noted.
   b. Types of soil with particular attention to vertical or horizontal drainage (i.e.) pervious or impervious soil.
   c. Kunai grass plots; jungles; thick undergrowths; rotting logs, brush and other organic debri in the area must be carefully noted.
   d. Rainfall per year and the time of rainy season are important factors.
   e. The presence of rats, mice, bandicoots and "crow pheasants" or "bush pheasants" must be noted.
   f. Information about the Area from Natives is often of value. It is especially important to ascertain whether or not the Natives consider the Area taboo.

2. Information from the Survey.
   a. Streams and drainage. If there are flood streams in the Area, whose banks approximate thick jungles and undergrowth, the Area is potentially dangerous.
   b. If the soil is impervious and not well drained, and if water stands in wide areas over long periods of time thoroughly wetting the surface soil, the Area is potentially dangerous. Whereas, sandy soil with rapid vertical drainage is not usually dangerous.
   c. Kunai grasslands in well drained, sandy soil that dries out quickly are not dangerous. Kunai grasslands on impervious soil with poor drainage, are excellent mite harboring areas. One criterion for judging dampness, as applied by an Australian Army Entomologist, is to walk through Kunai grass 3 or 4 days after a rain. If upon parting the grass and examining the soil, it is found that there is enough moisture to support algae growth, the Area may be dangerous. Mite eggs, larvae and adults may be collected from such soil and from the blades of Kunai grass an inch or two above the ground.
   d. Scrub Typhus appears to follow the onset of the rainy season. It is therefore important to ascertain seasonal and yearly rainfall data.
   e. The rodents and birds present in the Area, constitute the reservoirs for the disease. Trapping of rodents and examining their ears (externally and within) for mites, and postmortem examination of liver and spleen for rickettsiae, are important features of the survey.
   f. Native information, though not totally reliable and perhaps imaginative and exaggerated, is of some value as a "go ahead" or "danger signal".

3. Protection. Under no conditions should a Scrub Typhus Survey party set out without applying a repellent. It should be sprayed or rubbed on the skin of the ankles and legs up to the knees, around the waist and neck, and on hands and wrists. Sox, trouser's legs, flys and shoe, boot or leggin eyelets should be thoroughly treated. The best repellent is dibutylphthallate. If this is not available then dimethylphthallate or Repellent 612 are adequate. This protection will last a day in the field.

4. Typical Scrub Typhus Area.
   a. Impervious black top soil.
   b. Poor vertical drainage.
   c. Extensive "damp" Kunai grasslands.
   d. Scattered debri of organic nature (i.e.) rotten logs, decayed leaves, thick-lush undergrowth and matted impenetrable jungles.
   e. Flood streams that run through or by thick jungles.
   f. The presence of rats , mice, bandicoots and scrub pheasants in the Area.
   g. The finding of mite eggs, larvae or adults on the soil, under leaves along the creek banks, or on blades of Kunai grass. Standing still for three minutes or so in one spot is often long enough to collect larvae or adults on the shoes or boots.

5. Control Measures. If the conditions outlined in (4) exist, and it is imperative that troops be quartered in such an Area, the methods worked out for control by the 6th Malaria Survey Unit are as follows:
   a. ALL Kunai grass in the Area must be cut level with the ground, piled up and burned or hauled out of the Area to be dumped and buried. The later method has to be adopted in the rainy seasons.
   b. Adequate horizontal drainage must follow the grass clearing.
   c. Removal of every scrap of rotting or decayed vegetable matter from the entire Area to be burned or buried.
   d. "Burning over" the entire Area by means of oil sprayed from power sprayer. A power sprayer, using #2 diesel oil can be used as a "flame thrower" to burn over all the soil denuded of grass.
   e. After burning operations, the entire soil area must be oiled or sprayed with a ten per cent solution of creosote.
   f. All buildings to be erected, must be rat proofed and all food brought into the Area must be kept in rat proof containers. Food in quarters should be prohibited.
   g. Scrupulous attention to efficient garbage disposal is imperative.
   h. Strict policing of the Area, constant re-cutting and burning of grass are features of importance.
   i. Rat catching and poisoning program and proper disposal of carcasses by burning should be immediately instituted upon entering an Area.
   j. Personal protective measures should include:
      1. Application of repellent as above described.
      2. Wearing of leggins or high top boots.
      3. Placing all Kunai grass and gulleys "OFF LIMITS."
      4. Bed clothing and personal clothing must not be allowed to touch the ground at any time.
      5. Prohibiting all personnel from sitting on the ground, on rotting logs or in Kunai grass or using dry kunai grass as mattress filler material.
      6. All personnel must be cautioned to stay on beaten paths or roads.
      7. Motion picture theaters should be provided with seats or else the showing of pictures should be prohibited.
   k. An educational program consisting of lectures, posters and drill in the use of repellents should be instituted immediately or even previous to arriving in an area.

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PARASITOLOGICAL STUDIES FROM SAIDOR, N. G., (Con't)

During the past month the 5th Malaria Survey Unit has continued its parasitological studies on the natives of the Saidor area. Two groups of children (ages estimated to be between 2 to 12 years) were studied. The following results were obtained.

	PARASITIC INDEX	TYPE OF PARASITE					GAMETOCYLE RATE	TYPE OF GAMETOCYLE			SPLENIC INDEX	AV. SPLEEN VOL.
		P.v	P.f	P.m	P.v + P.f	P.v, P.f & P.m		P.v	P.f	P.m		
Group 1 - (113)	35%	62%	33%	0%	2.5%	--	--	-	-	-	96%	2.3
Group 2 - (110)	65%	63%	17%	9%	--	1%	14%	-	40%	60%	66%	1.7

In Group 1 the majority of those showing positive blood smears were under five years of age. The same facts in regard to positive blood smears and palpable spleems also held for Group 2.

It is felt that the disparity of the two camps -- Group 1 with a high splenic index and Group 2 with a high parsitic index, and a considerable lower splenice index -- may be explained by the fact that the children in Group 2 have more recently acquired their infection and that their immunity mechanism is not yet well developed.

The following is an approximate estimate of the reported work done to date by the 4th through 15th malaria control units since their arrival in the SWPA through January 1944. Only those tasks done in common are considered, and such important items as educational man hours, miscellaneous repair hours are not considered. The reports have been inspected, and a common nomenclature of types of jobs has been derived. In many instances it is know that the items are incompletely reported, and that undoubtedly more work has been done than shown. It is suggested in the future that a standard nomenclature of project-reporting -- such as outlined below -- be used by the control units in their monthly reports.

Unit	Ditching (lineal ft.)			Brushing	Oiling					Ditch Maint.	Clearing (acres)	Fill (cuyd)	Acres vert. drain	Stream train. (yds)	Plough acres
					Hand		Power		Total						
	Hand	Machine	Total	(lin ft)	Gals.	Acres	Gals.	Mi.	Gals	(lin ft)					
4th	32,732	7,173	39,805	19,500	9,683	2,233*	70	8	9753[illegible]	80,950	-	-	-	-	-
[illegible]	10,055	-	10,0[illegible]	5,800	4,695	-	-	-	4,695*	6,200	0.46	-	-	-	-
6	64,390	-	64,390	23,880	3,485*	-	2,080*	270	5,565*	6,200	-	-	-	-	-
7	-	-	-	-	2,325	55	-	-	2,325	-	-	8,025	4.7	-	-
8	45,113	-	45,113	12,215	18,031	-	-	-	18,031	38,935	1.15	-	-	4,048	22
9	-	-	-	-	350	-	-	-	350	-	-	-	-	-	-
10	-	-	-	-	4,816	-	-	-	4,816	68,640	-	-	-	-	-
11	40,175	-	40,175	55,620	2,478	-	-	-	2,478	-	-	-	-	-	-
12	22,725	-	22,725	-	543*	190	-	-	543	18,480	450	2,680	-	37,287	-
13	42,100	-	42,100	-	25,615	-	-	-	25,615	8,150	-	-	-	9,533	-
14	48,131	-	48,131	-	13,443	348	-	-	13,443	1,375	1.3	285*	-	-	-
15	600	-	600	42,240	12,024	-	-	-	12,024	-	22	-	-	-	-
									97,488 -- Total						

* Operation mentioned in report, but incomplete figure given.

\- Operation mentioned in report, but no figure given.

Technical memorandum, No. 4, Hq, USASOS, 10 February 1944, Office of the Chief Surgeon, states that "The War Department has directed that no information concerning malaria control measures in overseas theaters shall be given out. This limitation of subject matter will be observed."

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In the 18 February 1944 issue of Yank Down Under General G. C. Marshall, Chief of Staff, is quoted as having said on his recent visit to the New Guinea area: "I was especially gratified to find that the malarial hazard had been largely bested by fine discipline and elaborate arrangements. The contrast between the incidence of malaria six months ago and today is pleasing."

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Changes in Location -- The 17th MSU has completed its move and in now at Oro Bay in toto.

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The 17th MSU prior to leaving the Milne Bay area, made an interesting survey of larval breeding in water points along the various streams in the area. Eighteen water points were examined, and in five (5) Anopheles larvae were found. The water points with larval breeding were all constructed by creating reservoirs by daming or obstructing a stream. The stream margins were grassy, and in some instances larvae were found as far as 45 - 60 feet above the stream obstruction. Conclusions drawn from this water point survey:

a. All obstructions and dams should be removed from streams where water is caused to overflow into grass, or is raised high enough to reach overhanging grass on the banks.

b. Ideally, water points should be in the form of wells adjacent to streams, which are unobstructed.

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Commencing this month USASOS has established a School of Tropical Medicine at Base A. The course lasts one week for Medical officers, and 2 - 3 days for line officers. The malaria portion of the course covers the following items:

1. Discussion of AR, Malaria Control and Discipline (45 mins)
2. Life cycle of the Mosquito. (45 mins)
3. Control methods and their application. (45 mins)
4. Field exercises in Control Methods. (5 hours)
5. Projection of TF 8-953.
6. Life cycle of malaria parasite in Mosquito and man. (45 mins)
7. Symptoms and signs of malaria. (45 mins)
8. Discussion of principles of suppressive and curative therapy of malaria parasites. (1½ hours)
9. Laboratory identification of malaria parasites. (9 hours)
10. Chemotherapy of malaria (incld suppression). (1½ hours)
11. Round table discussion of treatment of malaria (1 hour)

Other topics included in the course are scrub typhus, filariasis, dengue, uncinariasis, dysentery, and tropical dermatitides.

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The 34th Malaria Survey Unit has been "visiting" in this theater in the Base A area, but will be returning to the Central Pacific Theater shortly. The Commanding Officer, and entomologist of the unit is 1st Lt. H. R. Roberts, Sn. C., who is the co-author of Pts. I & II of the "Mosquito Atlas" published by The Am. Ent. Soc. The parasitologist of the unit is 1st Lt. E. R. Helwig, Sn. C.

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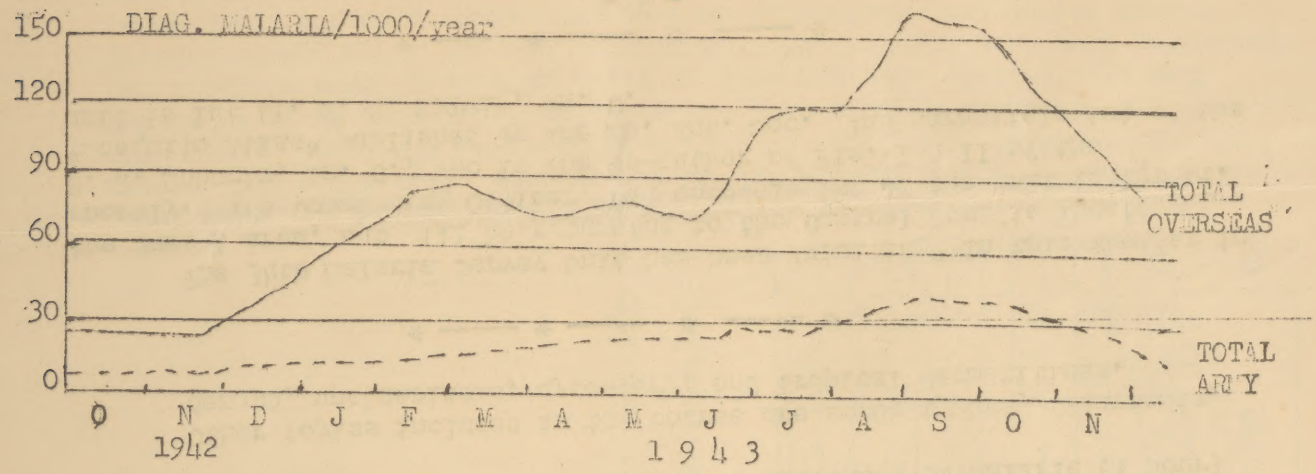
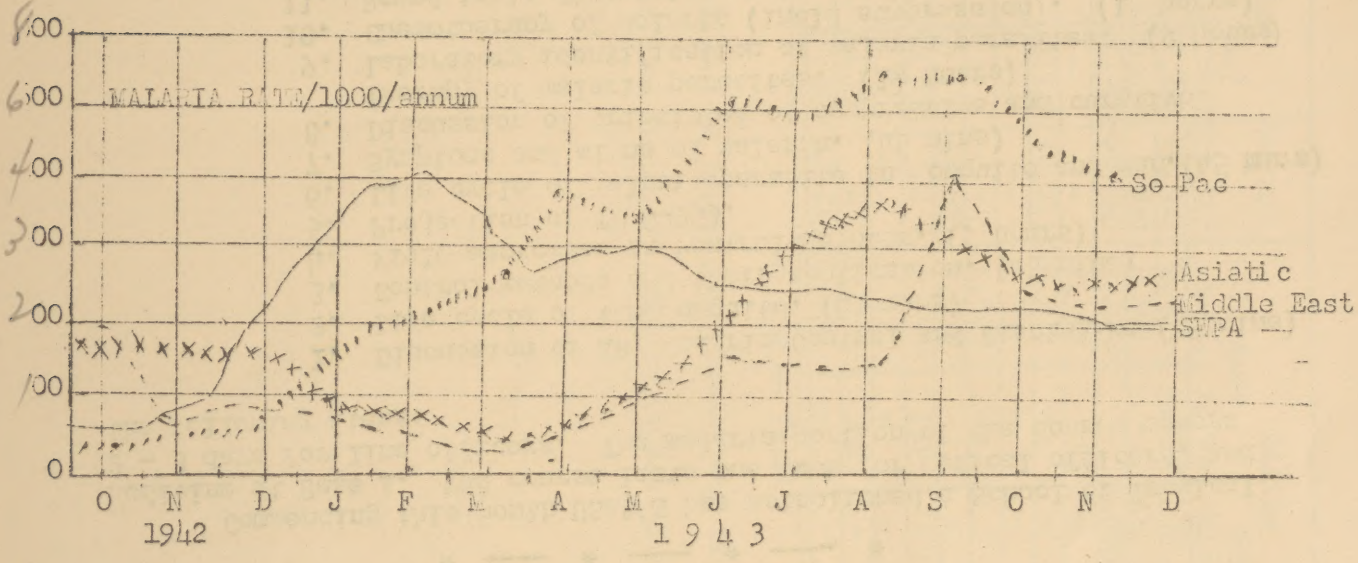
The following Charts are taken from the Monthly Progress Report of Health, U. S. Army.





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In Last months's issue of this paper (Vol.I, No. 3) a tentative plan was given for the re-organization of the malaria control group in this theater. This plan is being put into effect, and thereby decentralization will occur. Each force (Sixth Army, Fifth Air Force, and USASOS) will have a malariologist. Staff Memorandum No. 12, Hqs, USASOS, 8 Feb 1944, designates Major Donald S. Patterson,MC, as Malariologist, USASOS, % Intermediate Section, USASOS, APO 503. Malariologists for the Sixth Army and 5th Air Force are yet to be designated.

The personnel and units are attached as follows:

1) Sixth Army --
   a) Asst. Malariologists -- Capt D. R. Minter, MC, Capt E. A. Flexman, MC.
   b) Survey units -- 5th, 6th, 26th, 27th, 28th, 29th.
   c) Control Units -- 5th, 7th, 12th, 15th, 52nd, 53rd, 54th, 55th, 56th.

2) Fifth Air Force --
   a) Asst. Malariologists -- Major F. J. Dy, MC, Capt J. H. Coffey, MC, Capt V. H. McMahan, MC.
   b) Survey units -- 4th, 30th, 31st, 32nd.
   c) Control units -- 6th, 11th, 13th, 14th, 59th, 60th, 61st, 62nd, 63rd.

3) USASOS --
   a) Asst. Malariologists -- Major H. M. Jesurun, MC, Capt T. R. White, MC, Capt V. Handy, MC, Lt. D. Kirkham, MC, Lt. F. Davenport, MC.

b) Survey units -- 17th, 24th, 40th, 41st.
c) Control units -- 4th, 8th, 9th, 10th, 58th, 64th, 67th, 68th, 69th.

The system of forwarding reports will be much the same as previously. As long as components are still assigned C.G., USASOS, reports will be addressed to C.G., USASOS, APO 501 (Through Channels). Two copies of the report will be mailed directly to the Malariologist of the force (SOS, FAF, Army) to which the component is attached. One of these copies will be mailed direct by the malariologist to the Chief Malariologist, Col. H. F. Smith, PHS. The units will direct the original and adequate copies of the reports to C. G., USASOS, APO 501 (Through Channles) -- said channels being those of command. All other funcions of the old office, Hq, Malaria Control, are assumed by the malariologists of the respective forces (FAF, SOS, Army).

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Analysis of malaria case cards through the month of January tabulates the case incidence for New Guinea as follows:

	PRIMARY						RECURRENT						Total
	P.v.	P.f.	P.m.	Mix.	T U	S Tot	P.v.	P.f.	P.m.	Mix.	TU.	S Tot	
AUGUST	482	159	0	0	771	712	291	95	0	2	49	437	1149
Sept	435	235	0	6	93	769	337	135	0	1	32	505	1274
Oct	632	140	2	9	176	959	419	106	1	27	131	684	1643
Nov	586	154	1	3	243	987	457	85	1	5	169	717	1704
Dec	553	246	5	10	284	1098	357	95	1	3	154	610	1708
Jan	407	139	4	5	201	756	272	70	0	5	130	477	1233
S Tot	3095	1073	12	33	1068	5281	2133	586	3	43	665	3430	8711

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The following information is taken from the Minutes of the Conference on Insect Repellents May 18, 1943 of the National Research Council, Division of Medical Sciences acting for Committee on Medical Research of the Office of Scientific Research and Development.

Toxicity of Gesarol

Dr. Calvery and Dr. Smith each discussed the toxicology of Gesarol.

Dr. Calvery stated that "when a 5% powder, either dry or mixed with saline, was applied to the skin of rabbits there was no irritation to the skin and no systemic involvement. When dissolved in a solvent (such as carbitol which does not sensitize itself) there was only one possible slight indication of sensitization. The purified recrystallized material placed on intact skin causes no irritation but does cause a slight irritation on abraded areas. When micronized (particles average 5) gesarol concentrate was made into a 25% solution in butyl phthalate and held in contact with an animal for 24 hours the following results were obtained: at a rate of 4 or 6 cc./kilo body weight there was no systemic effects but there was a slight irritation; at 9.4 cc./kilo there was death in 1 animal. A 5% solution applied daily over a 2 week period at a rate of 1, 2, and 4 cc. per kilo of body weight caused definite systemic effects. A spray of the material in alcohol or benzyl benzoate is irritating but the irritation is most probably due to the solvent. One gram per kilo is needed to kill when injected intraperitoneally. When fed dissolved in corn oil the LD_{50} was found to be between 140 and 380 milligrams per kilo of body weight. The action is very variable in different species. These concentrations, altho they affect rats, do not kill chicks or rabbits. As a daily routine diet for rats, the following oral toxicities were determined: A .025% mixture (equals daily intake of 50 to 100 milligrams per kilo) fed over a period of two weeks showed no effect; 0.1% (equivalent to 1 gram

per kilo per day) all died within 3 days. Dr. Calvery concluded that the gesarol concentrate was not too toxic for consideration in 2 or 3 types of uses, such as for louse powders and bedbug control.

"Dr. Calvary also pointed out that the thanites were less toxic than the straight chain alkyl lauryl thiocyanates and in general the lauryl thiocyanates are as toxic as gesarol. Both thanites and thiocyanates are more readily absorbed than gesarol and are more irritating.

"Dr. Smith's results showed that the toxicity of gesarol was a little higher than the results of Dr. Calvery's experiments and he urged great caution before allowing its use on a large scale. There is a species as well as individual variability to its toxicity. A cat fed 0.3 gms/kilo developed severe nervous involvement and spastic muscles within 12 hours;- hyperexcitability and generalized tremors resulted. Dr. Smith also pointed out that we must be sure that there is no absorption thru the skin,-otherwise systemic involvement is a real danger. Results show that there is some absorption thru the skin. Also the possibility of cumulative effects have not been studied . The material acts like phenol except that there is a lag period of several hours before effects show up, but when the symptoms start they are persistent. Rats develop tremors after 5 days,-ascending spinal convulsions ending in respiratory paralysis, when fed gesarol. In addition to its phenol-like action, gesarol concentrate shows some of the characteristics of benzol poisoning because of its effects on the leucocytes. Since gesarol is 3 times as toxic as phenol to rats and 2 times as toxic to rabbits and only 1/3rd as toxic as phenol to cats, Dr. Smith posed the question of species differences in absorption. When mice are exposed in a chamber to an aerosol of a 1% sol., they become walzing mice within 45-60 minutes. Dr. Smith concluded that the material is extremely toxic and dangerous when absorbed and its indiscriminate use is not warranted."

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Newly arrived survey units should give especial attention to the care of their microscopes and lenses. Tropical climatic conditions predispose to "etching" and fungous growth in lenses. When electricity is available, dry closets should be constructed with an electric light bulb within it to serve as the heat source. In the event electricity is not available, dry closets with calcium chloride as the dessicating agent is a fairly adequate substitute.

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The following is a copy of the report sent in by the 11th Malaria Control Unit of the Special Purpose of Aircraft Dusting.

1. Dusting was done with a "Piper Cub" (L4-B). Installation of the hopper necessitated the removal of the front seat where a tank or hopper is installed. A wind driven generator operates the agitatior in the tank or hopper which feeds the dust into the constriction of the sliding door which can be operated by the pilot. When the aeroplane is travelling at about 60 miles per hour a high velocity of air current is created at the narrowest part of the venturi tube, and a partial vacumn at its outlet. The dust is well broken up as it enters the tube and is blown out of the tube in an even cloud.

2. The initial trial flight was made by Lt. George E. Reckles, test pilot of the 376th Service Squadron on 11 February 1944 from strip No. 2 (APO 713, Unit 1). The area dusted was east of the Markham River along foot hills. A half hopper (approx. 50 lbs.) consisting of 25% paris green and 75% road dust by volume. The road dust was sieved through the smallest mesh screen available (Approx. 30 mesh screen). The mixing of the paris green with the road dust was done with a shovel as no mixing apparatus was available. The aeroplane traveled at a speed of 60 miles per hour and flying at altitudes varying from 5 to 25 feet above the ground. Photographs were taken of the aeroplane before and during initial trial flight.

3. The second dusting was made 12 February 1944 south of the Markham

River to the foot hills with the hopper half open and no results as to effective dusting was reported by the Survey Unit as they were unable to cross the Markham River at that time.

4. On 18 February 1944 glass slides coated with a film of grease were placed on the ground north of the Markham River and the pilot was given a signal which area was to be dusted where the slides had been placed. Preceding the take off the pilot was instructed to open fully the slide door of the hopper. The area was dusted at an altitude of approximately 20 feet. The glass slides were than collected and the number of paris green particles per square inch counted under a microscope with reflected light cut out. The particles exceeded 12 per square inch which is considered a very useful method for estimating the distribution and concentration of the the paris green.

5. The final test made on 22 February 1944 was made along side of a creek north of the Markham River and adjacent to the Australian Malaria Control Unit. Glass slides were placed on bare ground and also at the roots of Kunai grass. The pilot was instructed to fly approximately 20 feet above the ground with the slide door of the hopper half open. The slides were examined and found to be 15 particles of paris green per square inch.

6. The area dusted was swampy but to date very few Anopholine larvae were reported in this area by the Survey Unit and this area was the most suitable for dusting.

7. It is extimated that 4/5 of a pound of paris greenvas applied to one acre using as a basis, aeroplane speed 60 miles per hour, lethal path 25 feet, 5 minutes dusting time using 75 pounds of dust consisting of 25% paris green to 75% road dust by volume.

8. Payload of dust did not exceed 75 pounds as pilot reported this amount was all he would take to insure safe flight.

9. It is recommended that if dusting is to be a general practice in the future a L5-B be converted for dusting as the pay load would be greater and consequently longer dusting time and less landing for reloading.

10. As noted in paragraph 4 of Headquarters, Advance Echelon, Fifth Air Force letter I believe it would be worth while to conduct a test at TAFF as conditions there are such that flying would be at an even altitude and in observing the toxicty of a batch of paris green the distribution and concentration of the mixture and the suitability of the diluent.

11. If pools or puddles exist where an appreciable amount of breeding is taking place the following test could readily be carried out.

12. Various points in the area to be dusted are selected and a specified number of dips are made in each breeding place with a ladle or dish, the average number of larvae obtained per dip is counted. The places where the dipping was done are marked by stakes. Twenty-four hours after dusting the process of dipping is repeated and the results compared.

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Japanese Statistics on Malaria. (Reprinted from South Pacific Newsletter.)

Captured Japanese medical reports for the Solomons, New Britian, and New Guinea forces during the period December 1942 through February 1943 show that malaria was an extremely serious and increasing problem during that time for the Japanese. Statistical analysis of three groups

is summarized in Table I.

TABLE I

	Number Studied	Malaria rate (New patients) 1000/annum	Malaria Deaths
December	51,382	450	1
January	61,501	1,098	8
February	79,901	1,637	13

During the month of April 1943 the total malaria rate for Rabaul and vicinity was 2053/1000/annum, according to other captured documents. While it is unsafe to draw sweeping conclusions from such data, the above Japanese malaria rates are considerably in excess of American malaria rates for the Solomons and New Hebrides during the same periods and indicate either inferior malaria control methods or more difficult topographical malaria control problems.

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Captain Darlington, Sn. C., CO of the 26th Malaria Survey Unit now at Cape Gloucester, has been evacuated because of injuries received as the result of an underwater battle with a crocodile. Captain Darlington said the prompt action of his men prevented his being drowned and he thinks he is tremendously lucky. Our best wishes, Captain, for a speedy recovery.

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Host preference studies with A. p. moluccensis, made in the South Pacific, with insectary-reared adults showed that when given a choice between feeding on man or cow, eight out of nine adult anophelines readily fed on the cow in preference to man (two individuals). A. p. moluccensis was also shown to feed readily on horses, goats, hogs, dogs, and chickens.

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Information has reached this office that the repellent known by the trade name of SKAT 0-262 is dimethylphthalate.

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The following is a copy of a report sent in by Captain W. R. Horsfall of the 17th Malaria Survey Unit.

1. This unit has been operating a human bait trap nightly at this base for two weeks. Results indicate that the trap is a means of obtaining reliable data on relative adundance of mosquitoes.

2. The trap is designed to fit over an army cot with its mosquito bar. It is made of screen wire with two narrow louvres extending around the cage. The bottom louvre is 12" from the cot level, and the top one is 10" above the other. The cage opens at the end by a pivot door. A loose canvas bottom to the cage follows the contour of the cot and prevents the escape of the mosquitoes below. Walls, sides and top are screen wire. Louvres are ½" wide and slant upward and inward. Mosquitoes buzzing at the side of the cage enter the slits but cannot go out through them.

3. The sleeper is fully protected from bites by a standard mosquito net tied in the cage at the corners. An extra layer of thick cloth around the bottom of the net assures that the sleeper will not be bitten should he come in contact with the bar.

4. The trap and cot fits easily into a weapons carrier with tail gate down. Each night the trap is loaded into the carrier and taken to a designated place. The driver goes to bed in the trap. Mosquitoes attracted to the sleeper enter the slits in the side and are trapped between the cage and mosquito bar. In the morning mosquitoes are collected in a catching tube and removed to the laboratory for identification and dissection.

The following is an examination given by Major Harold M. Jesurun, MC, Malariologist at Base B.

At the class for Malaria Unit details of this Base on Friday March 10th a quizz consisting of 10 questions was given. There were 21 present, among which were two officers. The following questions were asked:

1. Define Malaria Control. What are the two main divisions of Malaria Control?
2. What are the 5 most important factors in Individual Malaria protection?
3. What are the three most important factors in Environmental control? Which one of these is the easiest and most used in the field?
4. How long does it usually take for a mosquito to be born from the time the egg is laid?
5. Why do we oil standing water or slow moving water at least once a week?
6. What is the advantage of Malariol and Diesel oil, or distillate over ordinary crankcase oil?
7. Draw the larva of Anopheles mosquito and that of a pest (culicine) mosquito.
8. Draw an adult Anopheles mosquito and an adult pest (culicine) mosquito.
9. Why should Atabrine be given and taken daily, six days a week?
10. What grade do you think you deserve in this course?

The results were very encouraging. The average grade was 86.4. There were 5 papers with a 100 score. One of these was written by an officer. There were only 7 papers below the average. One paper with a score of 53 and another with a score of 56 were written by men who came in late and naturally did not do as well as those who were present for the lectures and demonstrations. Some of the answers to the last question were humorous. One man said, "I don't know, perhaps sergeant." Another "100% plus 10% for being a government employee." Of course he forgot the 20% for foreign duty! A T/5 answered "T/4".
In general the men seemed to have absorbed all that was taught to them. One man in answer to No. 9 said, "Because it keeps down Malaria and too its effect is not known by taking it today and miss taking it tomorrow." (This was the man who was late, however he showed some insight.)
A man's answer to No. 4 was "It takes a mosquito about one and a half days." Sort of fast, isn't it Entomologists?

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In the South Pacific an effort has been made to determine the time of activity of adults of A. p. punctulatus. During the daytime an average of 40 adults was found in tree trunks. At 1830 hours there was an average of 20 adults per tree trunk. The majority left the tree trunks between 1830 and 1900 hours. In night catches the first anopheline attempting to bite was noted at 1910 hours. Collecting was continued until 2130 hours, and in all 119 anopheline adults were captured of which 117 were A. p. moluccensis, and the other two A. p. punctulatus.

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The South Pacific reports the use of flumes on Guadalcanal for handling the problem of coastal lagoons obstructed by sandbars. The materials used were oil drums welded together in sections of six drums each. The inlet invert (lagoon side) was set approximately six inches below mean low tide, and the outlet invert approximately one foot above the floor of the sea. A drag line was used for necessary excavation, and a bulldozer for backfilling. Piling on each side of the flumes, extending into sea at four foot intervals, were set by means of a water jet (a portable high pressure tire pump was used for this work).

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MALARIA RATES, February 1944, for the weeks ending:

	USASOS	Sixth Army	FAF	14th AA
Milne Bay				
4 Feb	20.9	14.64	0	0
11	12.62	0	0	0
18	8.2	49.7	0	0
25	5.59	2.76	0	0
Oro Bay - Dobodura				
4 Feb	155	82	85	-
11	185	65	54	-
18	94	62	84	-
25	106	61	113	-
Finschhafen				
4 Feb	53	60	47	182
11	84	67	36	65
18	61	72	94	109
25	50	-	86	99

Port Moresby

	Mal	FUO	Mal	FUO	Mal	FUO
4 Feb	17.31	5.77	108.99	81.74	40.56	33.8
11	34.63	5.77	28.75	0.0	33.69	37.9
18	24.33	24.33	0.0	0.0	42.64	12.79
25	24.48	30.60	29.57	29.57	16.96	63.60

Lae				
4 Feb	123	-	340	-
11	107	-	170	-
18	109	-	0	-
25	93	-	0	-

	6th Army					Goodenough
February	4	11	18	25	4 Feb	10.0
Woodlark	-	0	20	-	11	5
Kiriwina	63	11	50	-	18	15
Saidor	294	77	103	-	25	23
Arawe	44	42	115	-		
Cape Gloucester	768.54	117.66	294.14	165.44		

32nd Division Rate -- Total 200.8

126th Inf.	-- 174.7
127th Inf.	-- 308.4
128th Inf.	-- 88.4
120th FA	-- 200.3
121st FA	-- None
126th FA	-- 20.4
129th FA	-- 82.7
114th Eng	-- 58.9
107 Med Bn	-- 280.0
Spec Trps	-- 54.1
Hq Div Arty	- None
632nd TD	-- 55.0

	GUSAP (FA)
4 Feb	96.3
11	141
18	64.2
25	81

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